Mastering Java Programming

Course Duration: 120 Hours **Course Code : JAVA-701**

1. Course Overview

The *Mastering Java Programming* course is a complete training program designed to take learners from beginner to advanced levels in Java. This course covers **Core Java fundamentals, Object-Oriented Programming, Collections, Multithreading, JDBC, and advanced Java concepts** like Servlets, JSP, and frameworks. It also includes hands-on projects with **Spring Boot, REST APIs, and Microservices**, preparing learners for **enterprise application development**. By the end, participants will have the skills to build scalable, secure, and high-performance applications using Java.

2. What You'll Learn?

- Java syntax, data types, operators, and control statements
- Object-Oriented Programming (OOP) concepts in Java
- Exception handling and Java I/O streams
- Collections Framework and Generics
- Multithreading and Concurrency
- JDBC for database connectivity
- Servlets, JSP, and Java EE basics
- Building RESTful APIs with Java and Spring Boot
- Working with Hibernate and JPA

- Microservices architecture with Java
- Unit Testing and debugging Java applications
- Deployment and integration with Docker & cloud platforms

3. Target Audience

- Beginners aspiring to become Java developers
- Programmers who want to strengthen Java skills
- Students and professionals preparing for **Java Developer roles**
- Developers aiming to work on enterprise applications and microservices

4. Pre-Requisites

- No prior programming experience required (course starts from basics)
- Familiarity with computers and logical thinking
- (Optional) Prior knowledge of C/C++ is helpful but not mandatory

5. Course Content

Module 1: Introduction to Java Programming

- Overview of Java Platform and JVM
- Installing JDK and setting up IDE
- Writing, compiling, and running Java programs

Module 2: Core Java Fundamentals

- Variables, Data types, Operators
- Control Flow Statements (if, switch, loops)
- Arrays and Strings

Module 3: Object-Oriented Programming in Java

- Classes, Objects, and Methods
- Inheritance, Polymorphism, Encapsulation, Abstraction
- Interfaces and Abstract Classes

Module 4: Exception Handling and Java I/O

- Types of Exceptions and Exception hierarchy
- Try-catch-finally, throw, throws
- File Handling and Serialization

Module 5: Collections and Generics

- Lists, Sets, Maps, and Queues
- Comparable vs Comparator
- Generics and Lambda Expressions
- Stream API in Java 8+

Module 6: Multithreading and Concurrency

- Threads lifecycle and synchronization
- Executor framework
- Concurrency utilities

Module 7: JDBC and Database Connectivity

- JDBC architecture
- Connecting Java applications to databases
- CRUD operations with JDBC

Module 8: Advanced Java – Servlets & JSP

- Web application basics
- Servlets lifecycle and session management
- JSP and JSTL

Module 9: Java with Frameworks

- Introduction to Hibernate and JPA
- Spring Framework and Spring Boot basics
- Building REST APIs with Spring Boot

Module 10: Microservices and Cloud Deployment

- Microservices with Java and Spring Cloud
- Dockerizing Java applications
- Deploying on Kubernetes and cloud platforms

Module 11: Testing and Debugging

- JUnit and Mockito for unit testing
- Logging with Log4j and SLF4J
- Best practices for debugging Java applications